UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,338	03/13/2006	Norio Hasegawa	P70456US0	1519

136 7590 05/29/2008

JACOBSON HOLMAN PLLC
400 SEVENTH STREET N.W.
SUITE 600
WASHINGTON, DC 20004

EXAMINER	
HSIEH, PING Y	

ART UNIT	PAPER NUMBER
2618	

MAIL DATE	DELIVERY MODE
05/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,338	HASEGAWA ET AL.	
	Examiner	Art Unit	
	PING Y. HSIEH	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment of abstract was received on 3/26/08. The amendment is acceptable.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Peak power suppressing section for transmitter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ode et al. (U.S. PG-PUB NO. 2001/0007435) in view of Hongo et al. (U.S. PATENT NO. 6,931,239).

-Regarding claim 1, Ode et al. disclose a transmitter which adjust a signal level of a multicarrier signal obtained by combining multiple carriers, said transmitter **(as disclosed in Fig. 10)** comprising; an input power calculating section for calculating the level of the signal for each carrier before the signal is inputted to the peak suppressing section **(comparison unit 29 as disclosed in Fig. 3 and further disclosed in paragraph 96 and 114)**; an output power calculating section for calculating the level of the level suppressed signal for each carrier after the level suppressed signal is outputted from the peak suppressing section **(distortion compensation coefficient calculation unit 27 as disclosed in Fig. 3 and further disclosed in paragraph 112)**; and an adjusting unit for controlling the signal level of a signal to be outputted such that the signal level of the signal is adjusted based on the level calculated by the input power calculating section and the level calculated by the output power calculating section **(predistortion unit 23 as disclosed in Fig. 3 and further disclosed in paragraph 87 and 114)**. However, Ode et al. fails to disclose a peak suppressing section for detecting whether there exists a peak based on the level of an inputted signal and outputting a level suppressed signal when the peak is detected.

Hongo et al. disclose a peak suppressing section for detecting whether there exists a peak based on the level of an inputted signal and outputting a level suppressed signal when the peak is detected **(peak detection unit 13 as disclosed in Fig. 3 and further disclosed in col. 7 line 45 – col. 8 line 3)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the comparison unit as disclosed by Ode et al. to include the peak detection unit 13 as disclosed by Hongo et al. One is motivated as such in order to provide for the peak to be power-limited before output to an amplifier.

-Regarding claim 2, Ode et al. disclose a transmitter which adjusts the signal level of a multicarrier signal obtained by combining multiple carriers **(as disclosed in Fig. 10)**, the transmitter comprising: an input power calculating section for calculating power level for each carrier before the carriers are inputted to the peak suppressing section **(comparison unit 29 as disclosed in Fig. 10 and further disclosed in paragraph 96 and 114)**; an output power calculating section for calculating power level for each carrier after the carriers are outputted from the peak suppressing section **(distortion compensation coefficient calculation unit 27 as disclosed in Fig. 10 and further disclosed in paragraph 112)**; a monitoring section for outputting level control information which controls the signal level of the multicarrier signal based on the power level calculated by the input power calculating section and the power level calculated by the output power calculating section **(distortion compensation coefficient updating unit 28 as disclosed in Fig. 10 and further disclosed in paragraph 113 and 118)**; and a level adjusting section for adjusting the level of the multicarrier signal based on the level control information outputted from the monitoring section **(predistortion unit 23 as disclosed in Fig. 10 and further**

disclosed in paragraph 87 and 114). However, Ode et al. fail to disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected; and power calculation is for mean power.

Hongo et al. discloses a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected **(peak detection unit 13 as disclosed in Fig. 3 and further disclosed in col. 7 line 45 – col. 8 line 3)**; and power calculation is for mean power **(col. 11 lines 48-67)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the comparison unit as disclosed by Ode et al. to include the peak detection unit 13 as disclosed by Hongo et al. One is motivated as such in order to provide for the peak to be power-limited before output to an amplifier.

-Regarding claim 3, Ode et al. disclose a transmitter which controls the signal level of a multicarrier signal obtained by combining multiple carriers such that the signal level of the multicarrier signal is adjusted **(as disclosed in Fig. 10)**, the transmitter comprising: an input power calculating section for calculating

power level for each carrier before the carriers are inputted to the peak suppressing section **(comparison unit 29 as disclosed in Fig. 10 and further disclosed in paragraph 96 and 114)**; an output power calculating section for calculating power level for each carrier after the carriers are outputted from the peak suppressing section **(distortion compensation coefficient calculation unit 27 as disclosed in Fig. 10 and further disclosed in paragraph 112)**; a monitoring section for outputting level control information which controls the signal level of each carrier outputted from the peak suppressing section based on the power level calculated by the input power calculating section and the power level calculated by the output power calculating section for each carrier **(distortion compensation coefficient updating unit 28 as disclosed in Fig. 10 and further disclosed in paragraph 113 and 118)**; and a level adjusting section for adjusting the level of each carrier based on the corresponding level control information for each carrier **(predistortion unit 23 as disclosed in Fig. 10 and further disclosed in paragraph 87 and 114)**. However, Ode et al. fail to disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected; and power calculation is for mean power.

Hongo et al. disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and

outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected **(peak detection unit 13 as disclosed in Fig. 3 and further disclosed in col. 7 line 45 – col. 8 line 3)**; and power calculation is for mean power **(col. 11 lines 48-67)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the comparison unit as disclosed by Ode et al. to include the peak detection unit 13 as disclosed by Hongo et al. One is motivated as such in order to provide for the peak to be power-limited before output to an amplifier.

-Regarding claim 4, Ode et al. disclose a transmitter which adjusts the signal level of a multicarrier signal obtained by combining multiple carriers **(as disclosed in Fig. 10)**, the transmitter comprising: an input power calculating section for calculating a power level of the sum for each carrier before the carriers are inputted to the peak suppressing section **(comparison unit 29 as disclosed in Fig. 10 and further disclosed in paragraph 96 and 114)**; an output power calculating section for calculating a power level of the sum for each carrier after the carriers are outputted from the peak suppressing section **(distortion compensation coefficient calculation unit 27 as disclosed in Fig. 10 and further disclosed in paragraph 112)**; a monitoring section for outputting level control information which controls the signal level of the multicarrier signal based on the power level of the sum calculated by the input power calculating

section and the power level of the sum calculated by the output power calculating section **(distortion compensation coefficient updating unit 28 as disclosed in Fig. 10 and further disclosed in paragraph 113 and 118)**; and a level adjusting section for adjusting the level of the multicarrier signal based on the level control information outputted from the monitoring section **(predistortion unit 23 as disclosed in Fig. 10 and further disclosed in paragraph 87 and 114)**. However, Ode et al. fail to disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected; and power calculation is for mean power.

Hongo et al. disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected **(peak detection unit 13 as disclosed in Fig. 3 and further disclosed in col. 7 line 45 – col. 8 line 3)**; and power calculation is for mean power **(col. 11 lines 48-67)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the comparison unit as disclosed by Ode et al. to include the peak detection unit 13 as disclosed by Hongo et al. One is motivated

as such in order to provide for the peak to be power-limited before output to an amplifier.

-Regarding claim 5, Ode et al. disclose a transmitter which adjusts the signal level of a multicarrier signal obtained by combining multiple carriers **(as disclosed in Fig. 10)**, the transmitter comprising: an input power calculating section for calculating a power level for the multicarrier signal before the multicarrier signal is inputted to the peak suppressing section **(comparison unit 29 as disclosed in Fig. 10 and further disclosed in paragraph 96 and 114)**; an output power calculating section for calculating a power level for the multicarrier signal outputted from the peak suppressing section **(distortion compensation coefficient calculation unit 27 as disclosed in Fig. 10 and further disclosed in paragraph 112)**; a monitoring section for outputting level control information which controls the signal level of the multicarrier signal based on the power level calculated by the input power calculating section and the power level calculated by the output power calculating section **(distortion compensation coefficient updating unit 28 as disclosed in Fig. 10 and further disclosed in paragraph 113 and 118)**; and a level adjusting section for adjusting the level of the multicarrier signal based on the level control information outputted from the monitoring section **(predistortion unit 23 as disclosed in Fig. 10 and further disclosed in paragraph 87 and 114)**. However, Ode et al. fail to disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the

carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected; and power calculation is for mean power.

Hongo et al. disclose a peak suppressing section for detecting whether there exists a peak based on the sum of power levels of inputted carriers and outputting the carriers the power levels of which are suppressed such that the sum of the power levels is smaller than a predetermined peak threshold value when the peak is detected **(peak detection unit 13 as disclosed in Fig. 3 and further disclosed in col. 7 line 45 – col. 8 line 3)**; and power calculation is for mean power **(col. 11 lines 48-67)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the comparison unit as disclosed by Ode et al. to include the peak detection unit 13 as disclosed by Hongo et al. One is motivated as such in order to provide for the peak to be power-limited before output to an amplifier.

Response to Arguments

6. Applicant's arguments filed 3/26/08 have been fully considered but they are not persuasive.

a. In page 10 of the remarks, applicant argues that according to the present invention in claims 1-3, a transmitter, which transmits a multicarrier signal obtained by combining multiple carriers through peak power suppression, band limitation, and quadrature modulation, performs carrier level adjustment for

adjusting the signal level of each carrier after the digital signal process based on mean input power of the carrier and mean output power of the carrier after the digital signal process, performs multicarrier level adjustment for adjusting the signal level of the multicarrier signal based on mean input power of an identified carrier and mean output power of the identified carrier after the digital signal process, or performs both of the carrier level adjustment and the multicarrier level adjustment.

-The examiner respectfully disagrees. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a multicarrier signal obtained by combining multiple carriers through *band limitation*, and *quadrature modulation*, performs carrier level adjustment for adjusting the signal level of each carrier *after the digital signal process* based on mean input power of the carrier and mean output power of the carrier *after the digital signal process*, performs multicarrier level adjustment for adjusting the signal level of the multicarrier signal based on mean input power of an identified carrier and mean output power of the identified carrier *after the digital signal process*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

b. In page 10 of the remarks, applicant argues that according to the present invention in claim 4, a transmitter adjusts the signal level of the multicarrier signal

based on mean input power of the sum of all carriers and mean output power of the sum of all carriers.

-The examiner respectfully disagrees. Ode et al. in combination with Hongo et al. indeed discloses a transmitter adjusts the signal level of the multicarrier signal based on mean input power of the sum of all carriers and mean output power of the sum of all carriers **(adjusting section (predistortion unit 23) reads a distortion compensation coefficient $h_n(p)$ conforming to the power p of the transmit signal x(t) out of the memory 22 and applying distortion compensation processing to the transmit signal using this distortion compensation coefficient selected by the distortion compensation coefficient updating unit 28 based on the input power calculating section (comparison unit 29) and the output power calculating section (distortion compensation coefficient updating unit 28) as disclosed in Ode et al., Fig. 10 and further disclosed in paragraphs 87, 112, 113, 114 and 118; Hongo et al. further disclose the power calculation is for mean power as disclosed in col. 11 lines 48-67)**.

c. In page 11 of the remarks, applicant argues that according to the present invention in claim 5, a transmitter adjusts the signal level of a peak power suppressed signal of a multicarrier based on mean input power before peak power suppression of the multicarrier and mean output power after the peak power suppression of the multicarrier.

-The examiner respectfully disagrees. Ode et al. in combination with Hongo et al. indeed discloses a transmitter adjusts the signal level of a peak power suppressed signal of a multicarrier based on mean input power before peak power suppression of the multicarrier and mean output power after the peak power suppression of the multicarrier **(adjusting section (predistortion unit 23) reads a distortion compensation coefficient $h_n(p)$ conforming to the power p of the transmit signal x(t) out of the memory 22 and applying distortion compensation processing to the transmit signal using this distortion compensation coefficient selected by the distortion compensation coefficient updating unit 28 based on the input power calculating section (comparison unit 29), which is obvious to be before peak power suppression and the output power calculating section (distortion compensation coefficient updating unit 28), which is after the peak power suppression as disclosed in Ode et al., Fig. 10 and further disclosed in paragraphs 87, 112, 113, 114 and 118; Hongo et al. further disclose the power calculation is for mean power as disclosed in col. 11 lines 48-67)**.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PING Y. HSIEH whose telephone number is (571)270-3011. The examiner can normally be reached on Monday-Thursday (alternate Fridays) 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lana Le can be reached on 571-272-7891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. Y. H./
Examiner, Art Unit 2618

/L. N. L./
Primary Examiner, Art Unit 2614